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E-mail : erda@erda.org
Web : http://www.erda.org
Certificate No. : TC-5389

TEST REPORT

ULR NO.: TC538918000006465F

NAME AND ADDRESS OF CUSTOMER RAJASTHAN POWERGEN TRANSFORMER PVT. LTD. KHASRA NO. 911-914, KAROLA-BHINMAL ROAD, KAROLA, SANCHORE, RAJASTHAN 343041	**REPORT NO.:** RP-1819-034196 **DATE** : 04.12.2018 **CUSTOMER REF. NO.** NIL — **DATE** 23.11.2018 **DATE OF SAMPLE RECEIPT** 13.11.2018 — **DATE OF TESTING** 28.11.2018 to 30.11.2018
SAMPLE DESCRIPTION **DISTRIBUTION TRANSFORMER (NON SEALED TYPE)** Manufactured by : RAJASTHAN POWERGEN TRANSFORMER PVT. LTD. Rating : 100 kVA Volts : 11000/433 V (at no-load) Current : 5.25/133.34 Amps Phases : 3/3 Vector group : Dyn11 Energy efficiency level : 3 Further details as per sheet no. 2.	**SAMPLE IDENTIFICATION** ERDA sample code number : ERDA-00286114 Manufacturer serial no.: RPTPL/MP/100/01 Year of manufacture : 2018 Customer : M/s. MPPKVVCL Enclosed drawing numbers : 1) RPTPL/RP/06 REV.No. 00 2) RPTPL/OGA/06 REV.No. 00
TEST DETAILS As per sheet 3 of 9.	**TEST SPECIFICATION** As per sheet 3 of 9.
TEST RESULTS : As per sheets from 4 of 9 to 8 of 9.	
ENCLOSURE: Photographs of test sample - As per sheet 9 of 9.	
REMARKS : 1) The transformer **conforms** to the guaranteed requirement as per above mentioned test specification for above mentioned test nos. 3 to 10. 2) Criteria limit has not been specified for test nos. 1 & 2.	
PREPARED BY — **CHECKED BY** — **APPROVED BY (Kapil J Sharma)**	

Note : 1. This report relates only to the particular sample received for testing in good condition at E.R.D.A.,Makarpura.
2. This report cannot be reproduced in part under any circumstances.
3. Publication of this report requires prior permission in writing from Director , E.R.D.A.
4. Only the tests asked for by the customer have been carried out.
5. In case of any dispute, Vadodara will be the exclusive jurisdiction & shall be construed as where the cause has arised.

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High Voltage Products Division Vadodara

TC 2669515

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REPORT NO.: RP-1819-034196 **Sheet :** 2 of 9
DATE : 04.12.2018

TECHNICAL SPECIFICATIONS OF TEST OBJECT ASSIGNED BY CUSTOMER

1.	Name of Manufacturer	RAJASTHAN POWERGEN TRANSFORMER PVT. LTD.
2.	Sr.No.	RPTPL/MP/100/01
3.	kVA rating	100
4.	Rated Voltage H.V.(Volts)	11000
5.	Rated Voltage L.V.(Volts)	433
6.	Rated Current H.V.(Amp.)	5.25
7.	Rated Current L.V.(Amp.)	133.34
8.	Number of phases	3
9.	Energy Efficiency level	3
10.	Vector Group	Dyn 11
11.	Winding Material	Aluminium
12.	Type of Cooling	ONAN
13.	Frequency (Hz)	50
14.	Guaranteed Percentage impedance %	4.5
15.	Total losses at 50 % load (Watts)	435
16.	Total losses at 100 % load (Watts)	1500
17.	Guaranteed temperature rise of oil/Winding	35/40°C
18.	Year of Manufacture	2018
19.	Standard no.	IS 1180 (PART-1) 2014 with amendment no. 1 & 2.,CBIP Manual & Customer's requirement

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REPORT NO.: RP-1819-034196 **Sheet :** 3 OF 9
DATE : 04.12.2018

	TEST DETAILS	TEST SPECIFICATION
1.	Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load	As per cl.no.21.2.c of IS 1180 (Part 1):2014
2.	Measurement of no-load loss and current	As per cl.no.21.2.d of IS 1180 (Part 1):2014
3.	Total losses at 50 % load	As per cl.no. 6.8 of IS 1180 (Part 1):2014
4.	Total losses at 100 % load	As per cl.no. 6.8 of IS 1180 (Part 1):2014
5.	No load current at 112.5 percent voltage	As per cl.no.21.4.c of IS 1180 (Part 1):2014
6.	Temperature-rise test	As per customer's requirement, testing procedure followed as per cl.no.21.3.b of IS1180(Part 1) : 2014
7.	Magnetic balance test	As per CBIP manual;Publication no.317-2013
8.	Oil leakage test	As per cl.no.21.2.j of IS 1180 (Part 1):2014
9.	Pressure test (routine test)	As per cl.no.21.2.h of IS 1180 (Part 1):2014
10.	Pressure test (type test)	As per cl.no.21.3.d of IS 1180 (Part 1):2014

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ULR NO.: TC538918000006465F

REPORT NO.: RP-1819-034196 **Sheet :** 4 OF 9

DATE : 04.12.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
1.	**Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load :** (As per cl.no.21.2.c of IS 1180 (Part 1): 2014)			---
	At 50% load : Tested with **2.6279** Amps (on HV side) Frequency : **50.000** Hz Average oil temperature : **23.6**°C			
	Test current (Amps)		2.6279	
	Impedance voltage (Volts)		267.25	
	Measured load loss (Watts)		294.3	
	Impedance voltage (%) (Computed to 50% load)			
	At 23.6°C		2.43	
	At 75°C	---	2.44	
	Load loss (Watts) (Computed to 50% load)			
	At 23.6°C		293.43	
	At 75°C	---	349.67	
	At 100% load : Tested with **5.2552** Amps (on HV side) Frequency : **49.997** Hz Average oil temperature : **23.6** °C			
	Test current (Amps)		5.2552	
	Impedance voltage (Volts)		535.14	
	Measured load loss (Watts)		1179.8	
	Impedance voltage (%) (Computed to 100% load)			
	At 23.6°C		4.86	
	At 75°C	4.5 (±10%)	4.91	**Conforms**
	Load loss (Watts) (Computed to 100% load)			
	At 23.6°C		1177.47	
	At 75°C	---	1401.93	

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DATE : 04.12.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
2.	**Measurement of no-load loss and current :** (As per cl.no.21.2.d of IS 1180 (Part 1): 2014) Tested with average **432.69** Volts (on LV side) Frequency : **49.957** Hz **RMS voltage** (Volts) **No-load current** (Amps) **Measured no-load loss** (Watts) **Corrected no-load loss** (Watts)	--	434.09 0.3742 67.59 67.37	--
3.	**Total losses at 50 % load (Watts) :** (As per cl.no.6.8 of IS 1180 (Part 1):2014)	Max. 435	417.04	**Conforms**
4.	**Total losses at 100 % load (Watts) :** (As per cl.no.6.8 of IS 1180 (Part 1):2014)	Max. 1500	1469.30	**Conforms**
5.	**No load current at 112.5 percent voltage :** (As per cl.no.21.4.c of IS 1180 (Part1): 2014) Test voltage of 112.5 percent of rated voltage at rated frequency was applied to the L.V. winding terminals and H.V. winding terminals were kept open circuited. No load current was recorded. **Test voltage**(Volts) **No load current** (Amps) **No Load current**(%)	Max. 6.0	487.21 2.2771 1.71	**Conforms**

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REPORT NO.: RP-1819-034196 **Sheet :** 6 OF 9
DATE : 04.12.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained value	Remarks
6.	**Temperature-rise test :** (As per customer's requirement, testing procedure followed as per cl.no.21.3.b of IS1180(Part 1) : 2014)			**Conforms**
	Before starting test, the dimensions of tank with radiator were measured & recorded. Size of tank : L-1020 mm, W-420 mm, H1-585 mm, H2-565 mm Size of fins : L- 400 mm, W- 300 mm, No. of Radiators – 02 Nos. No. of fins per radiator – 07 Nos.			
	Losses fed for temperature-rise test were 1500 Watts (Specified by customer) Specified losses were fed to the transformer (i.e. Supply was connected to HV winding and LV winding kept short-circuited) till steady state temperature-rise was attained. Top oil temperature was recorded hourly. After steady state condition, the losses were brought down in reference to the rated current one hour prior to shut down. At the shutdown, the hot windings resistance were measured and temperature-rise calculated.			
	A) Top oil temperature-Rise :	Max. 35°C	29.1°C	
	B) Winding Temperature Rise (Resistance method)			
	1) HV Winding :	Max. 40°C	37.1°C	
	2) LV Winding :	Max. 40°C	35.9°C	
	C) Ambient temperature at shutdown :		27.6 °C	
	D)Time of Shutdown(Hrs) :		20:30	

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REPORT NO.: RP-1819-034196 **Sheet :** 7 of 9
DATE : 04.12.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
7.	**Magnetic balance test :** (As per CBIP manual; Publication no.317 - 2013)			Conforms
	Voltage Applied Between / **Applied Voltage** (Volts) / **Measured Voltage Between**			
	2u & 2n / 100.10 / 2v & 2n	50 to 90 V	66.02	
	2u & 2n / 100.10 / 2w & 2n		39.67	
	2v & 2n / 100.18 / 2u & 2n	30 to 70 V	48.66	
	2v & 2n / 100.18 / 2w & 2n	30 to 70 V	51.65	
	2w & 2n / 100.10 / 2u & 2n		39.14	
	2w & 2n / 100.10 / 2v & 2n	50 to 90 V	67.77	
8.	**Oil leakage test :** (As per cl.no.21.2.j of IS 1180 (Part1): 2014) The assembled transformer with all fittings including bushings in position was tested at a pressure at the top equivalent to the head that was available at the base of the tank for 8 hours.	There should be no leakage at any point	No leakage observed.	Conforms
9.	**Pressure test (routine test) :** (As per cl.no.21.2.h of IS 1180 (Part 1: 2014) The transformer was tested at an air pressure of 35 kPa above atmosphere pressure maintained inside the tank for 10 min.	There should be no leakage at any point.	No leakage observed.	Conforms

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REPORT NO.: RP-1819-034196 **Sheet :** 8 of 9
DATE : 04.12.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
10.	**Pressure test (type test) :** (As per cl.no.21.3.d of IS 1180 (Part 1) :2014) ➢ The transformer tank was subjected to air pressure of 80 kPa for 30 minutes. The permanent deflection of flat plates were recorded, after pressure has been released. **Deflection Measured at** / **Length of plate (mm)** HV side 1020 LV side 1020 Side A 420 Side B 420 ➢ The transformer tank was subjected to vacuum of 250 mm of Mercury for 30 minutes. The permanent deflection of flat plates were recorded, after vacuum has been released. **Deflection Measured at** / **Length of plate (mm)** HV side 1020 LV side 1020 Side A 420 Side B 420 HV SIDE SIDE A SIDE B LV SIDE	Max. 6.5 mm Max. 6.5 mm Max. 5.0 mm Max. 5.0 mm Max. 6.5 mm Max. 6.5 mm Max. 5.0 mm Max. 5.0 mm There should be no air leakage at any point.	0.7 mm 0.4 mm 0.2 mm 0.1 mm 0.5 mm 0.3 mm 0.1 mm 0.0 mm No air leakage observed.	**Conforms**

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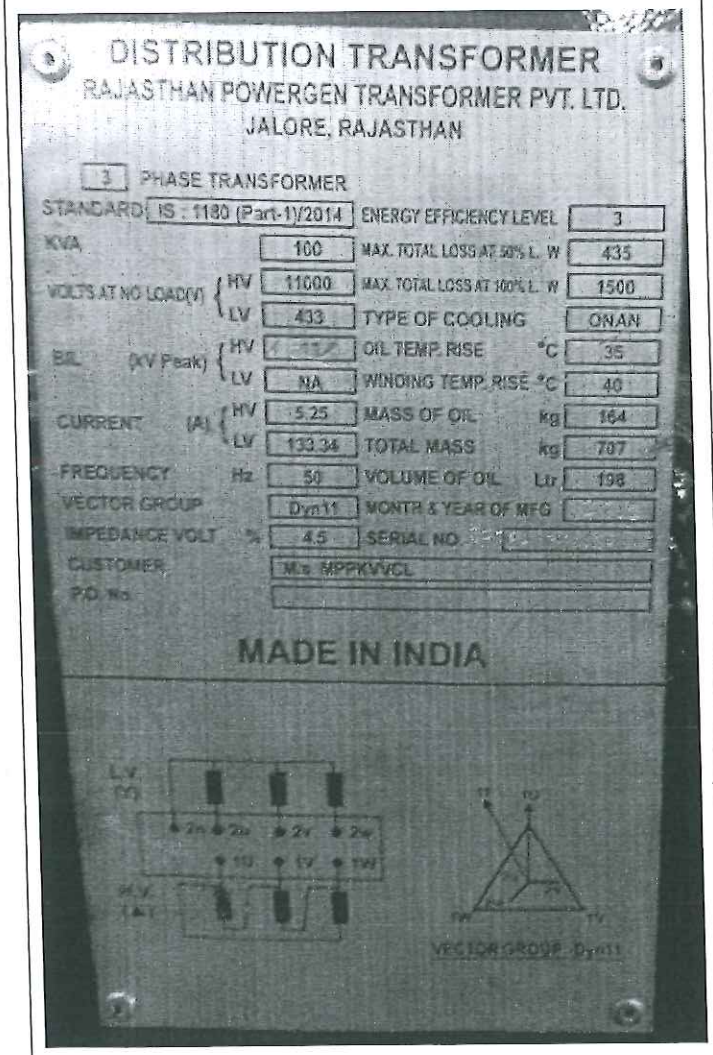
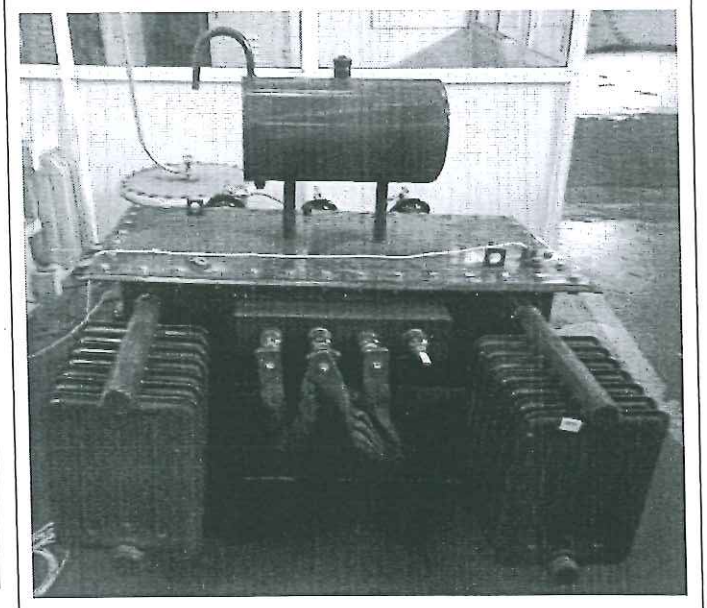
REPORT NO.: RP-1819-034196 **Sheet :** 9 of 9

DATE : 04.12.2018

PHOTOGRAPHS OF TEST SAMPLE





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105

95

175

165

DISTRIBUTION TRANSFORMER

RAJASTHAN POWERGEN TRANSFORMER PVT LTD
JALORE, RAJASTHAN

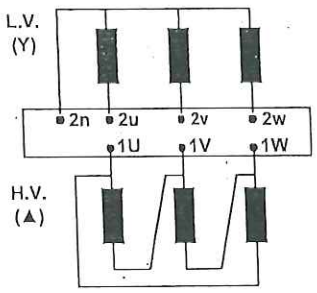
3 PHASE TRANSFORMER

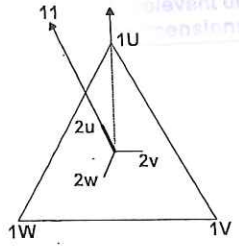
STANDARD	IS : 1180 (Part-1)/2014	ENERGY EFFICIENCY LEVEL	3
KVA	100	MAX. TOTAL LOSS AT 50% L. W	435
VOLTS AT NO LOAD (V) HV	11000	MAX. TOTAL LOSS AT 100% L. W	1500
VOLTS AT NO LOAD (V) LV	433	TYPE OF COOLING	ONAN
BIL (kV Peak) HV	75	OIL TEMP. RISE °C	35
BIL (kV Peak) LV	NA	WINDING TEMP. RISE °C	40
CURRENT (A) HV	5.25	MASS OF OIL kg	164
CURRENT (A) LV	133.34	TOTAL MASS kg	707
FREQUENCY Hz	50	VOLUME OF OIL Ltr	198
VECTOR GROUP	Dyn11	MONTH & YEAR OF MFG.	2018
IMPEDANCE VOLT . %	4.5	SERIAL NO. *	RPTPL/MP/100/01

CUSTOMER	M/s MPPKVVCL
P.O. No.	*

MADE IN INDIA

Part No.: RP-1819-034296
4/12/18.
100 kVA
ONAN





VECTOR GROUP :- Dyn11

NOTES :-

1- '*' MARKED ITEMS SHOULD BE PUNCHED AT THE TIME OF DISPATCH.

2- MATERIAL - ALUMINIUM ANODIZED

3- ALL DIMENSIONS ARE IN MM.

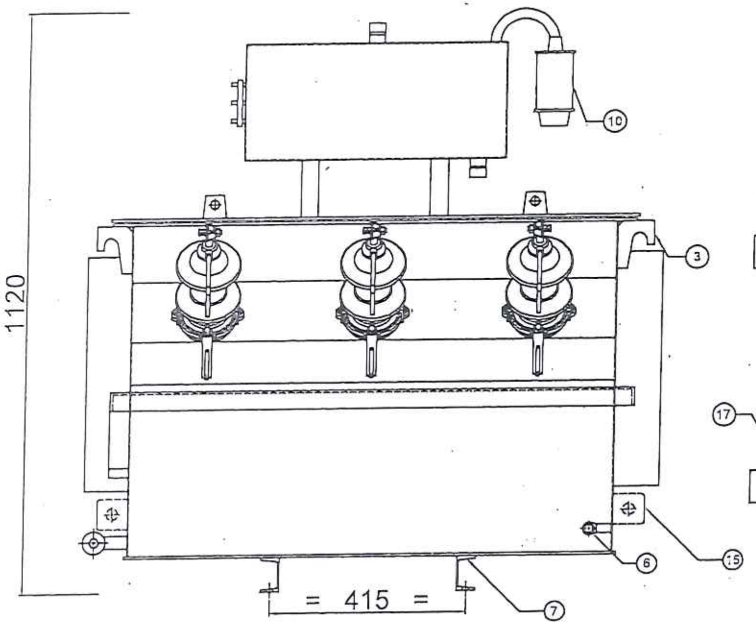
REVISIONS		
No.	DESCRIPTION	Sign. / Date

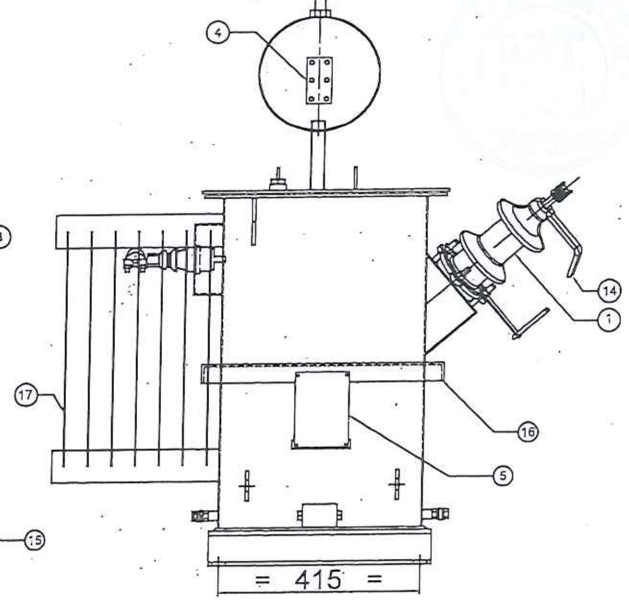
RAJASTHAN POWERGEN TRANSFORMER P. LTD.

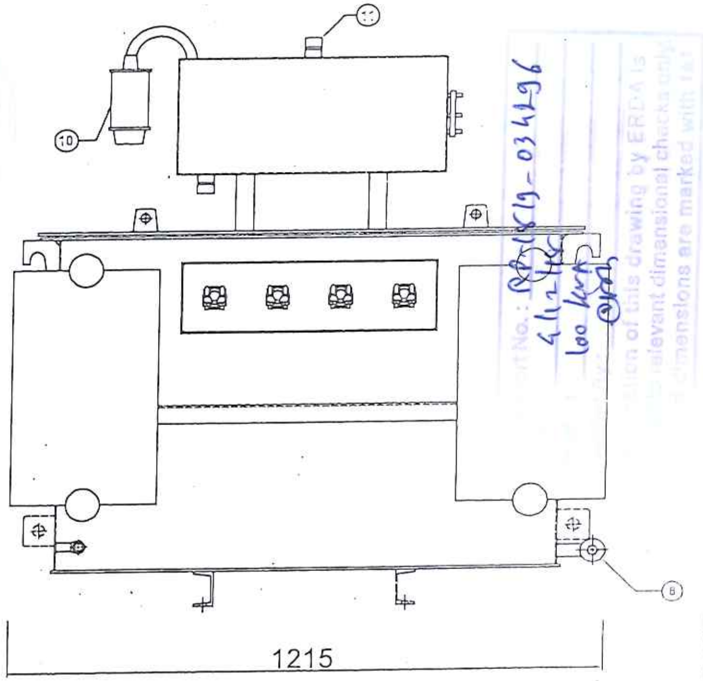
Title: RATING AND DIAGRAM PLATE

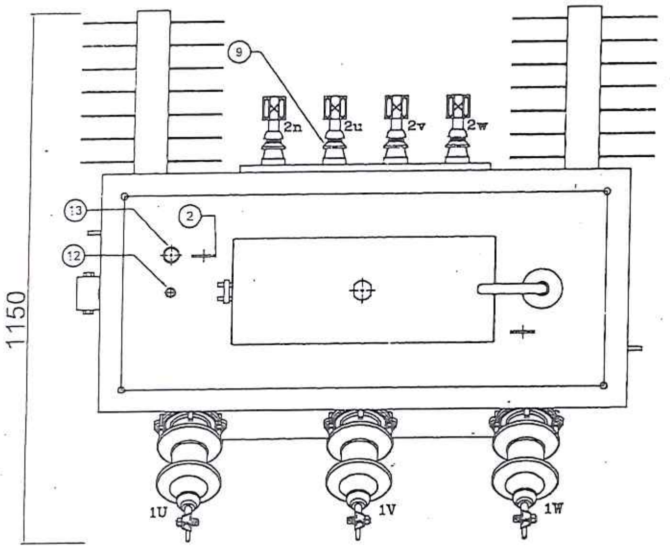
Rating : 100 KVA, 11/0.433KV, 3Ø, 50 Hz, ONAN, Aluminium Wound, Amorphous core, Distribution Transformer

Buyer's Reference: MPPKVVCL	ALUMINIUM WOUND AMORPHOUS CORE ENERGY EFFICIENCY LEVEL 3		Scale N.T.S.
DRN BY		DATE : 12.09.18	REV.No.
		DRAWING No. RPTPL/RP/06	00









Tank Inside Dimensions	
Length	1020
Width	420
Height	585/565

Conservator Dimensions	
Diameter	240
Length	480

WEIGHTS / QTY.		
TRANSFORMER OIL	Ltrs.	198
TOTAL TRANSFORMER	Kg.	707
TRANSFORMER OIL	Kg.	164
TANK & FITTINGS	Kg.	176
INTERNAL ASSEMBLY	Kg.	367

S. No.	Description	Qty.
17	Radiators 300W x 400H x 7fins	2 Set
16	Stiffner Angle	1 Set
15	Pulling Lug	4
14	Aching Horns for HV Bushings	3 set
13	Air Release Plug	1
12	Thermometer Pocket	1
11	Oil Filling Pipe with Cap (P1¼)	1
10	Breather with Silica Gel	1
9	LV Bushing with Bimetallic T.C.	4

S. No.	Description	Qty.
8	Drain cum Sampling Valve	1
7	Base Channel	2
6	Earthing Terminal with Lug	2
5	Rating & Terminal Marking Plate	1
4	Oil Level Indicator	1
3	Lifting Lugs for Complete Unit	2
2	Top Cover Lifting Lug	2
1	HV Bushing with Bimetallic T.C.	3

Notes :-

1) All dimensions are in mm & Weights are in kg.
2) Paint Shade : Aircraft BLUE colour conforming to Shade No. 108 of IS: 5 of 2007.
3) Overall dimensions & weights are subject to ± 10% tolerance.

Min. External Air Clearances in mm.		
VOLTAGE	H.V.	L.V.
PHASE TO PHASE	255	75
PHASE TO EARTH	140	40

RAJASTHAN POWERGEN TRANSFORMER P. LTD.

Title: OUTLINE GENERAL ARRANGEMENT DETAILS

Rating: 100 KVA, 11/0.433KV, 3Ø, 50 Hz, ONAN, Aluminium wound, Distribution Transformer

Buyer's Reference: MPPKVVCL

ALUMINIUM WOUND AMORPHOUS CORE ENERGY EFFICIENCY LEVEL 3

Scale: N.T.S.

DRN BY

DATE : 12.09.18

Drawing No. RPTPL/OGA/06

REV. No. 00